Real Time Vehicle Monitoring and Tracking System Using Wi-Fi and Android Application

P.Sai Kiran
M.Tech(Embedded System),
St.Martin's Engineering College.

K.Yadaiah, M.Tech,(Ph.D)
Associate Professor & HOD,
Department of ECE,
St.Martin's Engineering College.

ABSTRACT:

The suggested system would place within the vehicle whose position will be determined on the internet page and supervised at real-time. Within the suggested system, there's comparison between your current vehicle path and already specified path in to the file system of raspberry pi. The suggested system will make use of recent technology that according to Embedded Linux board namely Raspberry Pi and Smartphone android application. The suggested system creates GPS navigation/GPRS/GSM/WI-FI SIM900A Module including all of the three things namely GPS navigation GPRS GSM. A sophisticated vehicle monitoring and monitoring system according to Embedded Linux Board and android application was created and implemented for monitoring the college vehicle from the location A to location B at real-time. The GPS navigation current location from the vehicle GPRS transmits the monitoring information towards the server and also the GSM / WIFI can be used for delivering alert message to vehicle's owner mobile. Within the suggested system the already specified path within the raspberry pi's file system obtained from vehicle owner's android Smartphone using android application. Means picking a path from location one place to another happens from vehicle owner's android application which provides more safety and safeguards visiting the traveler. Therefore, the driver drives the automobile only around the vehicle owner's specified path. When the driver drives the automobile around the wrong path then your alert message is going to be sent in the suggested system towards the vehicle's owner mobile as well as loudspeakers alert driven using

Raspberry pi's audio jack. When the vehicle's speed goes past the required worth of the rate, then even the warning message is going to be sent from system towards the owner mobile.

**Keywords:** Raspberry Pi, Sensors, Embedded system.

I. INTRODUCTION:

Within the cities, human assistance is somewhat difficult in supplying the database of monitored vehicle. Within the suggested system, the machine supplies a fully automated monitoring and monitoring from the vehicle which useful for chartered bus, their proprietors, children's safety and it offers the accurate arrival duration of the automobile at particular location or stop. In last decade, we take notice of the motorists fatigue driving and vehicle thievery activity which in turn causes social real-time problem like accidents and much more hazards conditions [1]. We daily see or read these particular activities that are raising the issue in our security and safety both in private and public industries. So there's necessity of real-time monitoring and monitoring the automobile also storing and upgrading its database of specific situations. And therefore using precision over time, children can take more time in studying, sleeping, or relaxing instead of wait for postponed bus. Being economical time awaiting a bus improves comfortable and efficient personal time management from the student too. To be able to reduce man power and saving of cash, here the machine provides easy monitoring solution using Embedded Linux Board.

The suggested system get monitoring information from the vehicle like vehicle number (Unique ID), location, speed, Date, Some time and store in to the database of Raspberry pi. The machine offers students safety mechanism with the aid of temperature sensor and gas leakage sensor. Hence within the situation of raising the high temperature within the vehicle because of some reason or leakage from the LPG gas within the vehicle, the alert message get send towards the driver in addition to vehicle owner. For monitoring the automobile using GPS navigation and keep its database, MySQL database product is use which advanced feature of Raspberry-Pi. Within the database base monitoring and upgrading mechanism, the GSM/GPRS module can be used which transmit the up-to-date vehicle database towards the server and user connect to the database using web site in Smartphone. That shows the actual time vehicle location within the Smartphone. Thus, customers will have the ability to continuously monitor a moving vehicle when needed while using Smartphone and see the believed distance and here we are at the automobile to reach confirmed destination.

II. PREVIOUS WORK:

Continuously monitoring and monitoring the college vehicle at real-time atmosphere using web site in Smartphone and when the automobile choose wrong path then system provide the aware of the owner's Smartphone and also on raspberry pi's sound system. Offer safety atmosphere towards the children using gas sensor and temperature sensor by messaging alert. Storing and upgrading the actual time database from the vehicle like its Speed, Time, Location, and Date that is helpful just in case of car thievery recognition. The suggested system would get controlled with the aid of Raspberry pi which placed within the vehicle. The GPS navigation/GPRS/GSM SIM900A module get talk to raspberry pi using USB interface. The longitudes and latitudes of the present path caused by GPS navigation get in comparison using the stored longitudes and latitudes within the particular extendable within the database of raspberry pi. In the event that longitudes and latitudes not complement the

stored one then wrong path recognition alert massage can get delivered to vehicle's owner mobile. Even the longitudes and latitudes of the present path caused by GPS navigation can get delivered to the server with the aid of GPRS which will help to trace the vehicle's current location on the internet page using Smartphone. For monitoring the automobile, the suggested system provides login facility on web site for vehicle's owner, students as well as their parents. Also suggested system provides student's safety with the aid of DS18B20 temperature sensor and gas leakage sensor MQ6. These sensors get interface with raspberry pi [2]. When the temperature within the vehicle crosses the particular value or LPG gas get leakage within the vehicle then your alert message will delivered to the vehicle's owner. Likewise safety mechanism supplied by system.
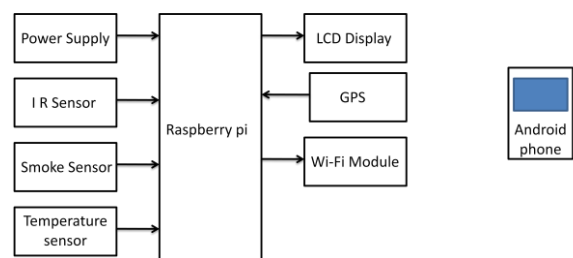
Fig.1. Proposed System Diagram

III. PROPOSED SYSTEM:

The suggested system creates GPS navigation/GPRS/GSM SIM900A Module including all of the three things namely GPS navigation GPRS GSM. The GPS navigation current location from the vehicle GPRS transmits the monitoring information towards the server and also the GSM can be used for delivering alert message to vehicle's owner mobile. The suggested system would place within the vehicle whose position will be determined on the internet page and supervised at real-time. Within the suggested system, there's comparison between your current vehicle path and already specified path. Within the suggested system the already specified path within the file system obtained from vehicle owner's android wise phone using android application. Real-time vehicle monitoring on the internet page using GPS

navigation/GPRS/GSM SIM900A module and Raspberry pi, SIM900A Module which will get connects using the Raspberry pi provides the real-time monitoring information from the vehicle for example longitude, latitude, speed, duration of the automobile [3]. That information obtained from USB interface get stored in to the database and additional transmits towards the server. The machine gives monitoring provision on web site for registered user only when i) super Login, ii) Primary Login, and iii) Secondary Login. Vehicle's right and wrong path monitoring formula using Smartphone, the suggested system provides more safety and secure solution using android application for wrong path alert. And therefore the suggested system can process further with that data. Now whenever driver drives the automobile around the owner's made the decision path i.e. one place to another, GPS navigation/GPRS/GSM SIM900A module within that vehicle transmits the longitudes and latitudes of current place to the raspberry pi through USB interface. The automobile owner's Smartphone getting an android application that gives the data regarding choice of particular path from one place to another by which the automobile designed to travel.

And therefore driver drives the automobile on the way that made the decision by android use of owner's Smartphone only. Initially vehicle's owner trace the made the decision path One place to another on android application that provides longitude and latitude of this particular path. Then android application saves that longitudes and latitudes of tracked path inside a particular extendable so that owner can send that file towards the raspberry pi database using Bluetooth or USB port. Now using file system programming, the present longitudes and latitudes caused by GPS navigation of GPS navigation/GPRS/GSM SIM900A module get compares using the longitudes and latitudes caused by android application [4]. Hence if the comparison gives less tolerance only then do we know that driver drives the automobile on the right track i.e. One place to another else if there's large distinction between

longitudes and latitudes then system transmits alert message around the vehicle owner's mobile the vehicle is around the wrong path using GSM of GPS navigation/GPRS/GSM SIM900A module. The longitudes and latitudes that are kept in the extendable inside raspberry pi happen to be obtained from android application using Bluetooth. Therefore, the wrong path recognition problem can get solve. Vehicle monitoring information database monitoring system, the automobile monitoring system works upon an formula by which, real-time information of car for example Longitudes, Latitudes, Speed, Date, and Time get store in to the database of Raspberry pi. The raspberry pi includes a 3.5mm audio jack output facility. The GPRS of SIM900A Module will sent this vehicle information towards the server, and also at server side, upgrading and storing of the vehicle information happens dynamically which will make simpler for monitoring and monitoring an automobile at real-time on web site using internet browser on Smartphone which provides better consequence of current location [5].

Students Safety mechanism using temperature Sensor and LPG gas identify sensor, the suggested system takes proper care of the children's safety by utilizing LPG Gas leakage sensor and temperature sensor. The high temperature sensor DS18B20 which utilizes a 1 wire protocol provides a digital output hence could be get directly interface using the Raspberry Pi. The brink worth of the high temperature occur this program. Likewise both sensors output travelled into Raspberry pi would get match up against threshold values and when limit crosses then your alert message will be presented to vehicle proprietors mobile using GSM of SIM900A module. In following results, the brink value set at 30 Degree Celsius. That output current could be controlled by utilizing current restricting resistors which will help the Raspberry pi's GPIO from damage.

IV.DESIGN OF PROPOSED HARDWARE SYSTEM

1) Embedded Linux Board:

Features of Raspberry pi board:
- 5V@1A maximum power from an adaptor.
- 700 MHz ARM1176JZF-S core (ARM11 family, ARMv6 instruction set).
- 1GHz operating speed.
- 4 USB ports for accessing external memory.
- 40 GPIO pins.
- Ethernet port for internet connectivity.
- VGA connector and HDMI connector.
- 3.5mm stereo jack for audio out to amplifier.
- Micro SD card interface slot to carry the OS.
- 512MB of SDRAM.

2) Sensor:
a) Temperature Sensor:

Specifications:
- Unique 1 wire interface requires only one port pin for communication.
- Each device has unique 64 bit serial code stored in an On Board ROM.
- Requires no External components.
- Can be powered from Data line; power supply rang is 3.0v to 5.5v.
- Measures temperature from -55 to +125 Degree C.

b) LPG Gas leakage sensor:

1 = Output
2 = Vcc (positive voltage)
3 = Gnd

Specifications:
- High sensitive to LPG Gas, Iso-butane, propane.
- Small sensitive to alcohol, smoke.
- Fast response.
- Stable and long life.
- Simple drive circuit

V. RESULTS

VI. CONCLUSION:

The primary goal the work would be to give information towards the driver as he makes its way into right into a specified area therefore he is able to drive the automobile based on the parameters from the zone. The suggested system hence made use of Smartphone technology by supplying safety and secure visiting the traveler using wrong path alert mechanism. Whenever driver drives vehicle around the wrong path or just in case of vehicle's accident situation happens, the suggested system offers the vehicle's current location, speed towards the vehicle owner's mobile. Student's safety mechanism also will get provided using temperature and LPG gas leakage sensors. Within these specific situations, according to student's safety concern, the suggested system also gives alert massage on student parents mobile to ensure that parents also learn about their children's safety. The suggested system plays a huge role instantly monitoring and monitoring of car by upgrading vehicle real-time info on the server side after certain interval of your time to be able to supervised vehicle continuously. Hence this advantages to track the automobile as soon as possible.

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Author's Details:

Mr. P. Sai Kiran received bachelors of Engineering in Electronics and Communication Engineering from Jawaharlal Nehru Technological University, Hyderabad. He is currently pursuing Masters in Embedded systems from Jawaharlal Nehru Technological University, Hyderabad.

Mr. K.Yadaiah, pursuing PhD in JNTUH under the guidance of Dr. B.L. RAJU, Principal ACE Engineering College. Post Graduated in Electronics and communication Engineering (M.Tech) From JNTUCE, Kakinada in Nov-2003 and Graduated in ECE (B.Tech) from JNTU, Hyderabad in 2001. He is working as An Associate Professor and Head, Department of Electronics and Communication Engineering in St. Martins Engineering College, R.R Dist, TS and India. He has 13+years of Teaching Experience. His Research area in Ph.D is Energy Efficient Routing in MANETS & Wireless Sensor Networks.